

# **SPEAKER BOX MOUNTING STRUCTURE**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

5           The present invention relates generally to speakers and, more specifically, to a speaker box mounting structure for a speaker system.

### **2. Description of the Related Art**

A conventional speaker support is known comprising a first swivel arm that can be turned relative to the mounting wall to which the speaker support is fastened, a  
10   second swivel arm that couples the speaker box to the first swivel arm for enabling the speaker box to be turned relative to the first swivel arm to the desired angle, and lock screws for locking the first swivel arm to the mounting wall and the second swivel arm to the first swivel arm respectively. This design of speaker box mounting structure is complicated. It is also complicated to adjust the angular position of the speaker box  
15   relative to the first swivel arm and the angular position of the first swivel arm relative to the mounting wall. Further, the speaker box must be locked to the second swivel arm of the support by screws or other fastening devices that may obstruct the structural strength of the speaker box.

Therefore, it is desirable to provide a speaker box mounting structure that  
20   eliminates the aforesaid drawbacks.

## **SUMMARY OF THE INVENTION**

The present invention has been accomplished under the circumstances in view. It is the main object of the present invention to provide a speaker box mounting  
25   structure, which enables the speaker box to be quickly and positively set in position

and conveniently adjusted to the desired angle.

It is another object of the present invention to provide a speaker box mounting structure, which is easy to install.

To achieve these objects of the present invention, the speaker box mounting  
5 structure comprises a holder base having a mounting plate for fastening to a wall or ceiling; a swivel arm set coupled to the holder base and adjustable relative to the holder base to a desired direction and angle; a coupling unit coupled to the swivel arm set, the coupling unit having a base, a coupling portion disposed at the base of the coupling unit, and two stop faces disposed at two sides of the coupling portion of the  
10 coupling unit and defining a contained angle; and a speaker box having a coupling portion coupled to the coupling portion of the coupling unit, and two stop faces disposed at two sides of the coupling portion of the speaker box and respectively stopped against the stop faces of the coupling unit.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

15 FIG. 1 is an exploded view of a speaker box mounting structure according to the present invention.

FIG. 2 is a front plain assembly view of the speaker box mounting structure according to the present invention.

FIG. 3 is a top plain assembly view of the speaker box mounting structure  
20 according to the present invention.

FIG. 4 is similar to FIG. 2 but showing the angular position of the second swivel arm adjusted relative to the first swivel arm.

FIG. 5 is a top plain view of FIG. 4.

FIGS. 6(a)~6(d) are schematic drawings showing different speaker box  
25 position adjustment examples.

FIG. 7 is an exploded plain view of a part of the present invention showing the coupling arrangement between the coupling unit and the speaker box according to the present invention.

FIG. 8 is an exploded plain view showing an alternate form of the coupling  
5 arrangement between the coupling unit and the speaker box according to the present invention.

FIG. 9 is an exploded plain view showing another alternate form of the coupling arrangement between the coupling unit and the speaker box according to the present invention.

10 FIG. 10 is an exploded plain view showing still another alternate form of the coupling arrangement between the coupling unit and the speaker box according to the present invention.

FIG. 11 is an exploded plain view showing still another alternate form of the coupling arrangement between the coupling unit and the speaker box according to the  
15 present invention.

FIG. 12 is an exploded plain view showing still another alternate form of the coupling arrangement between the coupling unit and the speaker box according to the present invention.

FIG. 13 is an exploded view showing the first coupling portion and second  
20 coupling portion of the coupling unit arranged at right angles according to the present invention.

## **DETAILED DESCRIPTION OF THE INVENTION**

Referring to FIGS. 1~7, a speaker box mounting structure in accordance with the present invention is shown comprised of a holder base **10**, a swivel arm set **20**, a  
25 coupling unit **60**, and a speaker box **90**.

The holder base **10** comprises a mounting plate **11**, which has a plurality of mounting holes **13** for fastening to the wall or ceiling with screws, a rod-like neck **15** disposed at the center of the mounting plate **11**, and an engagement member **17** disposed at the distal end of the neck **15** remote from the mounting plate **11**. The  
5 diameter of the engagement member **17** is greater than the neck **15**. Further, the engagement member **17** has a toothed portion **19** around the periphery.

The swivel arm set **20** is comprised of a first swivel arm **30**, a second swivel arm **40**, and a lock **50**.

The first swivel arm is comprised of a first clamping member **30A** and a  
10 second clamping member **30B**. The first clamping member **30A** comprises a recessed coupling portion **31** disposed at one end and adapted to receive the neck **15** of the holder base **10**, a first engagement structure **32** disposed above the recessed coupling portion **31** and adapted to engage the engagement member **17** of the holder base **10**, the first engagement structure **32** having a toothed portion **33** for engagement with the  
15 toothed portion **19** of the first engagement member **32**, a second engagement structure **35** disposed at the other end, the second engagement structure **35** comprising an annular coupling groove **36** and radial teeth **37** around the annular coupling groove **36**, and a through hole **39** transversely extended through two opposite sides between the first engagement structure **32** and the second engagement structure **35**. The second  
20 clamping member **30B** is substantially similar to the first clamping member **30A** with the exception of an added receptacle **38** at the outer end of the through hole **39**.

The second swivel arm **40** comprises an engagement structure **41** disposed at one end, the engagement structure **41** comprising an annular coupling flange **42** and radial teeth **43** at each of the two opposite sides corresponding to the annular coupling  
25 groove **36** and radial teeth **37** of the second engagement structure **35** of each of the

clamping members **30A** and **30B** of the first swivel arm **30**, a locating head **45** disposed at the other end, a plug hole **47** axially extended through the head **45**, and a transverse screw hole **48** disposed at the head **45** in communication with the plug hole **47** for receiving a tightening up screw **49**.

5           The lock **50** comprises a screw bolt **51** inserted through the through holes **39** of the clamping members **30A** and **30B** of the first swivel arm **30**, a compression spring **53** sleeved onto the screw bolt **51** and stopped between the clamping members **30A** and **30B** of the first swivel arm **30**, a wing nut **57** threaded onto the screw bolt **51** to secure the screw bolt **51** to the first swivel arm **30**, and a washer **55** sleeved onto the  
10 screw bolt **51** and stopped between the wing nut **57** and the first clamping member **30A**.

          The coupling unit **60** is comprised of a coupling rod **70** and a coupling block **80**.

          The coupling rod **70** comprises a shank **71** inserted into the plug hole **47** of  
15 the second swivel arm **40**, a locating groove **73** extended around the periphery of the shank **71** and adapted to receive the tightening up screw **49**, a locating head **75** disposed at one end of the shank **71**, and a screw hole **77** axially disposed at the locating head **75**.

          The coupling block **80** comprises a base **81**, a locating groove **82** disposed at  
20 the base **81**, a coupling portion, for example, a dovetail tongue **83** disposed at the base **81**, two stop faces **84** disposed at two sides of the dovetail tongue **83** and defining a contained angle, a mounting hole **85** extended through the base **81** and connected to the screw hole **77** of the coupling rod **70** by a screw **86**, and two screw holes **87** extended through the base **81** at two sides of the mounting hole **85** and adapted to  
25 receive a respective screw **88**.

The speaker box **90** comprises a coupling portion, for example, a dovetail groove **93** adapted to receive the dovetail tongue **83** of the coupling block **80**, and two stop faces **94** disposed at two sides of the dovetail groove **93** and adapted to stop against the stop faces **84** of the coupling block **80** respectively.

5 Referring to FIGS. 4~6 again, when loosened the lock **50**, the second swivel arm **40** is turned relative to the first swivel arm **30** to the desired angle, and then the lock **50** is fastened up to lock the second swivel arm **40** to the first swivel arm **30** again. As shown in FIGS. 6(a)~6(d), by means of the speaker box mounting structure of the present invention, the speaker box **90** can be adjusted to any of various positions.

10 In additional to the aforesaid preferred embodiment of the present invention, various modifications and changes could be made thereunto without departing from the spirit and scope of the invention. Some modified examples of the present invention are outlined hereinafter.

As shown in FIG. 8, the coupling portion **83A** of the coupling block is a  
15 dovetail groove, and the coupling portion **93A** of the speaker box is a dovetail tongue adapted to engage the dovetail groove **83A**.

As shown in FIG. 9, the coupling portion **83B** of the coupling block is a semispherical tongue, and the coupling portion **93B** of the speaker box is a semispherical groove adapted to receive the semispherical tongue **83B**.

20 As shown in FIG. 10, the coupling portion **83C** of the coupling block is a ball head, and the coupling portion **93C** of the speaker box is a ball socket adapted to receive the ball head **83B**.

As shown in FIG. 11, the coupling portion **93D** of the speaker box is formed in a mounting block detachably fastened to the speaker box.

25 As shown in FIG. 12, in addition to the coupling portion **83** for coupling to

the coupling portion **93** of the speaker box, the coupling block further comprises a second coupling portion **89**, which is a dovetail tongue disposed in parallel to the coupling portion **83** and adapted to engage a dovetail groove **79** at the coupling rod of the coupling unit.

5           As shown in FIG. 13, the second coupling portion **89A** of the coupling block of the aforesaid coupling unit and the coupling portion **83** are arranged at right angles.

As indicated above, the invention has the following advantages:

1. The speaker box mounting structure enables the speaker box to be quickly and positively set in position and conveniently adjusted to the desired angle.

10           2. The speaker box mounting structure is easy to install.